1206-148 Impact of Aortic Stiffness on the Risk of Ischemic Stroke in Elder Patients

Kenichi Sugioka, Robert R. Sciacca, Takeshi Hozumi, Yumiko Miyake, Inna Titova, Gabrielle Gaspard, Ralph L. Sacco, Shunichi Homma, Marco R. Di Tullio, *Columbia University, New York, New York.*

Background: Large aortic atheromas (AA) in the proximal aorta detected by transesophageal echocardiography (TEE) are associated with increased risk of ischemic stroke in the elderly. The atherosclerotic process also affects aortic distensibility, which can also be assessed by TEE. However, little is known about the relation between aortic stiffness and stroke risk. The purpose of this study was to evaluate the possible association of aortic stiffness with ischemic stroke, as well as the relationship between aortic stiffness and AA.

Methods: We performed TEE in 34 elderly patients with acute ischemic stroke (age 68.6 +/- 8.6 years, 14 men and 20 women) and in 30 consecutive control subjects (age 66.2 +/ - 9.0 years, 15 men and 15 women). The presence and maximum thickness of AA in the aortic arch was recorded. Maximum (Dmax) and minimum (Dmin) diameter of the proximal descending thoracic aorta during a cardiac cycle was measured on TEE-guided M-mode, and the blood pressure (BP) by cuff sphygmomanometry. Aortic stiffness index (β) was calculated as follows: β = ln (systolic BP / diastolic BP) / ([Dmax-Dmin] / Dmin), where ln is natural logarithm. The association of β and AA thickness with ischemic stroke was evaluated by logistic regression analysis after adjustment for potential confounders (age, gender, hypertension, diabetes mellitus, hypercholesteromia, cigarette smoking, coronary artery disease).

Results: β was significantly higher in stroke patients than in controls (10.1 +/- 5.2 vs. 5.9 +/- 4.0, p<0.001), as was AA thickness (3.7±2.6 mm vs. 2.4±2.2 mm, p<0.05). In stroke patients, β correlated with AA thickness (r=0.35, p=0.04). When AA thickness and other potential confounders were included in a multivariate analysis, β was found to be independently associated with ischemic stroke (odds ratio 1.3 per unit increase, 95% confidence interval 1.1-1.6).

Conclusion: 1) Aortic stiffness is associated with ischemic stroke, independent of AA thickness. 2) Aortic stiffness index may add prognostic information to AA thickness when assessing the risk of ischemic stroke in the elderly.

1206-171 Attenuation of Biological Compensatory Action of Cardiac Natriuretic Peptide System With Aging: Utility and Limitation of Plasma Brain Natriuretic Peptide Measurements in the Elderly

Keisuke Kawai, Katsuya Hata, Katsuji Tanaka, Yoshihisa Kubota, Ryuji Inoue, Ichiro Nakayama, Eisaku Masuda, Mitsuhiro Yokoyama, Toshiyuki Miyazaki, *Kanzaki General Municipal Hospital, Hyogo, Japan, Kobe University Graduate School of Medicine, Kobe, Japan.*

Background: Plasma brain natriuretic peptide (BNP) level is a sensitive and specific marker of left ventricular (LV) function, but the meaning of BNP in the elderly remains to be elucidated.

Methods: 282 subjects with creatinine level ≤1.5 mg/ml were divided into three groups; Those under 70 years old (Group 1), those 70 to 78 years (Group 2), and those over 78 years (Group 3). Plasma BNP, blood urea nitrogen, creatinine, clinical and echocardiographic data were evaluated. In addition, biological makers for BNP (cGMP) and for proximal tubule function [serum β2-microglobulin (β2M)] were also evaluated.

Results: Clinicopathological characteristics in 3 groups are shown in Table. Using multivariate analysis, predictors for BNP in Group 2 were LV mass, E/A and presence of valvular heart disease (VHD); Whereas β2M, systolic blood pressure, presence of VHD or atrial fibrillation and use of angiotensin converting enzyme-inhibitors were predictors in Group 3. The molar ratio of cGMP to BNP was significantly decreased with aging (Figure). Significant independent predictors of cGMP were BNP and use of nitrates in Group 2, and BNP, creatinine and use of digitalis in Group 3.

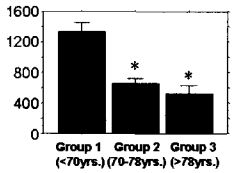
Conclusions: Measurements of BNP could be valuable in detecting LV remodeling, LV diastolic dysfunction and VHD even in the elderly patients. However, we should utilize the BNP level carefully in those over 78 years, because BNP and cGMP may be affected by renal dysfunction, and compensation of natriuretic peptide system will be attenuated with aging.

Table. Clinicopathological characteristics in three groups

Variable	Group 1 (n=124)	Group 2 (n=78)	Group 3 (n=80)
Age	59±9	74±3*	84±4*†
LV EDD (mm)	46±5	46±6	44±7
%FS (%)	39±6	39±6	37±7
LV mass (g)	155±48	167±63	152±51
E/A	0.90±0.27	0.77±0.24*	0.66±0.22*†
BNP (pg/ml)	22±26	77±147*	87±93*
cGMP (pmol/ml)	4.1±2.0	5.6±3.4*	5.5±2.4*
BUN (mg/dl)	15±4	17±4*	18±5*
Creatinine	0.8±0.2	0.8±0.2	0.8±0.2
β2M (mg/l)	1.6±0.4	1.9±0.6*	2.5±0.8*†
VHD (%)	1	7*	19*

Data are mean ± SD. *:p<0.0166 vs Group 1, †: p<0.0166 vs Group 2 by ANOVA
BUN = blood urea nitrogen;
E/A = early-to-atrial transmitral peak velocity ratio;
EDD = end-diastolic diameter; FS = fractioning shortening

Figure. cGMP/BNP molar ratio in three groups



Data are mean ± SEM.
*: P < 0.0001 vs Group 1

1206-172 Prognostic Significance of Elevated Plasma Brain Natriuretic Polypeptide in Patients With Chronic Renal Failure Treated With Hemodialysis

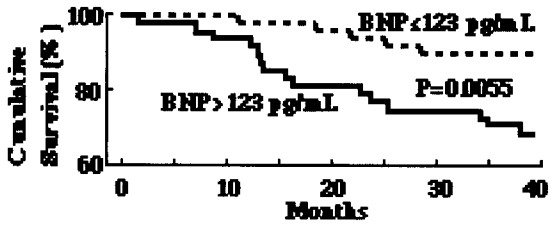
Shin-ich Inoue, Toshio Shimada, Yo Murakami, Ko Nakamura, Hiromi Shimizu, Harumi Katoh, Yoko Ohta, Nobuyuki Takahashi, Nobuyuki Oyake, Yutaka Ishibashi, Keiko Suzuki, *The 4th Department of Internal Medicine, Shimane Medical University, Izumo, Japan.*

Background: Cardiovascular and cerebrovascular disease are one of the most important complications for prognosis in dialysis patients. In the general population, brain natriuretic polypeptide (BNP) has been shown to reflect prognosis of patients with congestive heart failure, however, the clinical implication on high levels of plasma BNP remains unclear in dialysis patients. The goal of this study is to test whether plasma BNP levels can predict prognosis of dialysis patients.

Methods: One hundred and one patients without overt heart failure, who had undertaken with hemodialysis 3 times a week, were prospectively enrolled. All patients were followed for 40 months.

Finding: A total of 20 patients died of cardiovascular or cerebrovascular disease. Multivariate analysis was performed using Cox's proportional hazard model with end-points of death. Among plasma BNP, atrial natriuretic polypeptide (ANP), the other clinical biochemical and echocardiographic parameters tested with multivariate analysis, post-dialysis plasma BNP level (median: 123 pg/ml) was the most significant independent predictor of mortality (p=0.0055). Kaplan-Meier analysis showed poor long-term prognosis in patients with post-dialysis plasma BNP level of >123 pg/ml.

Interpretation: Plasma BNP levels after hemodialysis may be a useful parameter predicting mortality in patients treated with dialysis.



1206-173 Depressive Symptoms and Heart Rate Variability in Postmenopausal Women: An Ancillary Study to the Women's Health Initiative

Chin K. Kim, Beth A. Bartholomew, David Sheffield, Michelle Marsh, Tammy Dicken, Jackie Woodard, David Curb, Albert Oberman, Judith Hsia, Julius Gardin, Nathan Wong, Bruce Barton, Robert McMahon, David S. Sheps, *University of Florida, Gainesville, Florida.*

Background: Depressive symptoms have been associated with increased cardiac morbidity and mortality. Lower heart rate variability (HRV) has been shown to increase risk for cardiac events in both normal and coronary artery disease patients and may help explain these relationships. However, the relationship between depressive symptoms and HRV has been inconsistent across studies.

Methods: As an ancillary study to the Women's Health Initiative, 2699 postmenopausal women, aged between 50 and 83 years, were enrolled for further evaluation with 24 hour ambulatory electrocardiographic monitoring. A shortened Center for Epidemiologic Studies-Depression scale (CES-D) and Diagnostic Interview Schedule (DIS) were administered.

Results: Two hundred and eighty women (10.4 %) had depressive symptoms as measured by the CES-D/DIS. Women with depressive symptoms had lower HRV and higher average heart rate (HR) as seen in the table below. All differences remained significant (p< 0.02) after adjusting for age.

	Depressive Symptoms		
Means (SD)	Present	Absent	p value
Mean HR	77.1 (9.6)	75.5 (8.5)	0.008
SDNN	113.4 (30.7)	118.8 (32.2)	0.008
ASDNN	42.5 (14.2)	44.6 (16.5)	0.018
SDANN	102.5 (29.9)	108.2 (32.6)	0.005

Mean HR- average heart rate
SDNN- standard deviation of all normal R-R intervals
ASDNN- average of all 5 minute standard deviations of N-N intervals
SDANN- standard deviation of the 5 minute average of N-N intervals

Conclusion: Women with depressive symptoms on the CES-D/DIS had significant reductions in heart rate variability and increases in heart rates, suggesting increased sympathetic tone. This may help explain the increased cardiac morbidity and mortality associated with depression in other studies.